

# Module 8 Overview

## Introduction

This module introduces the generalization of the Gaussian Processes for regression. In particular, we will derive the formulation that leads to kernel versions of Gaussian Processes, and we will see the algorithms to optimize the parameters of the kernels and the noise parameter of the data likelihood. Also, we will give an interpretation of the kernel matrix as a covariance matrix.

Students are encouraged to review the supplementary slides where the GP for classification is summarized.

## Learning Objectives

By completing the activities for this module, students will be able to:

- Provide a derivation and the construction of a kernel Gaussian Process.
- Optimize the noise parameter  $\sigma^2_n$  of the likelihood function.
- Optimize the parameters of the kernel using maximum likelihood.
- Construct a kernel GP for regression and discuss their results.

## Required Instructional Materials

- The required materials are the slides and the problem statements for the assessments. Students are encouraged to use book [Gaussian Processes for Machine Learning](#), C. Rasmussen et al. This book has free access online.

## Activities

- Students are required to follow the slides and to turn in two assessments. Also, students are encouraged to use the discussion board to post questions or answer questions posted by other students.

*"All creative people want to do the unexpected."  
--Hedy Lamarr*



*Hedy Lamarr*

*Austrian-American actress and inventor.  
Developed and patented the Frequency Hopping radio communication method in use today.*

## Module 8 Summary

- Slides and homework
- Weekly Discussion

If you have questions about some aspect of Learn, **UNM LEARN Support** is available to troubleshoot technical problems.

Contact them 24/7 at [505-277-0857](tel:505-277-0857), [1-877-688-8817](tel:1-877-688-8817) or use the "Create a Support Ticket" link on the left Course Menu.